

Standard CSP

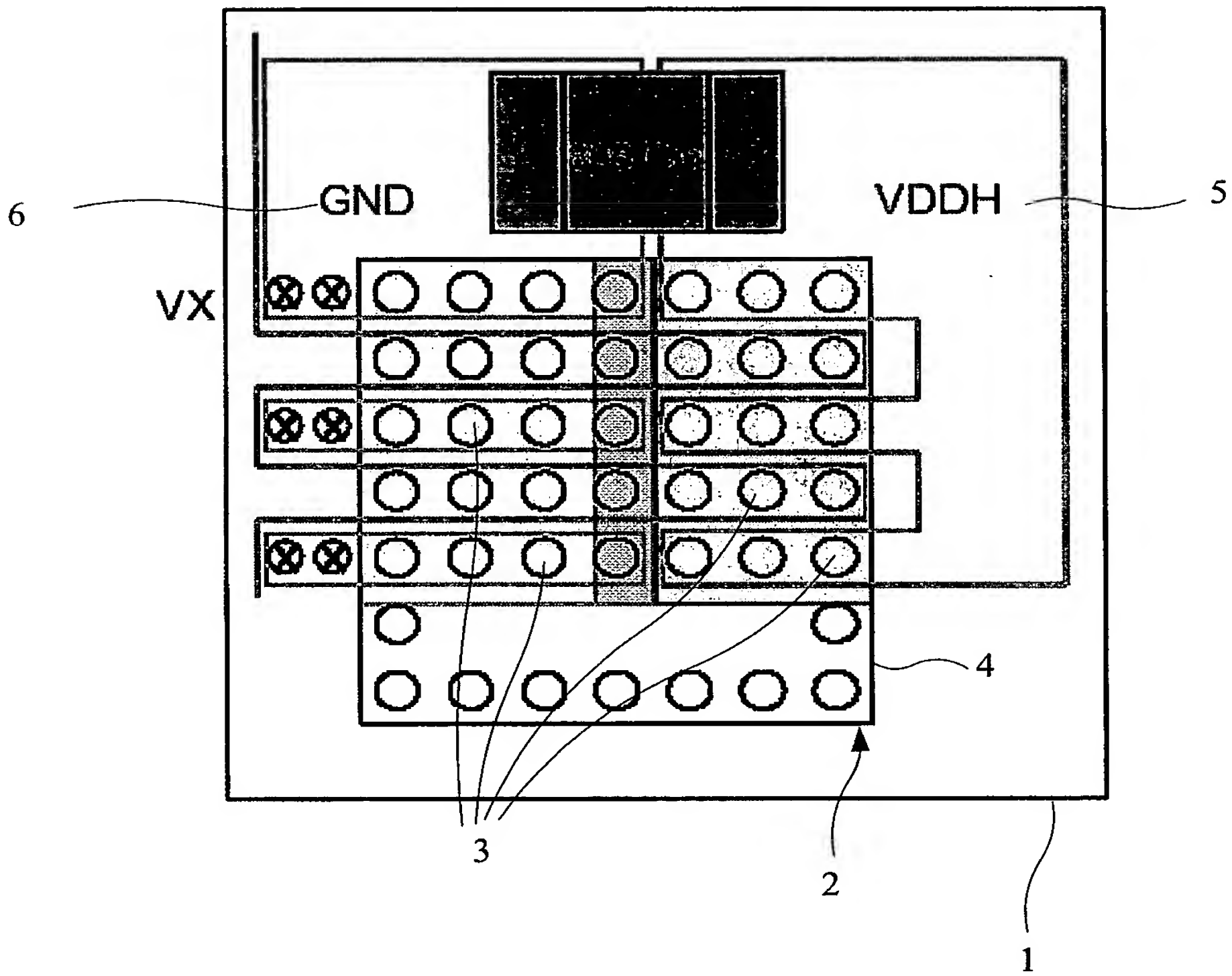


FIG. 1
(Prior Art)

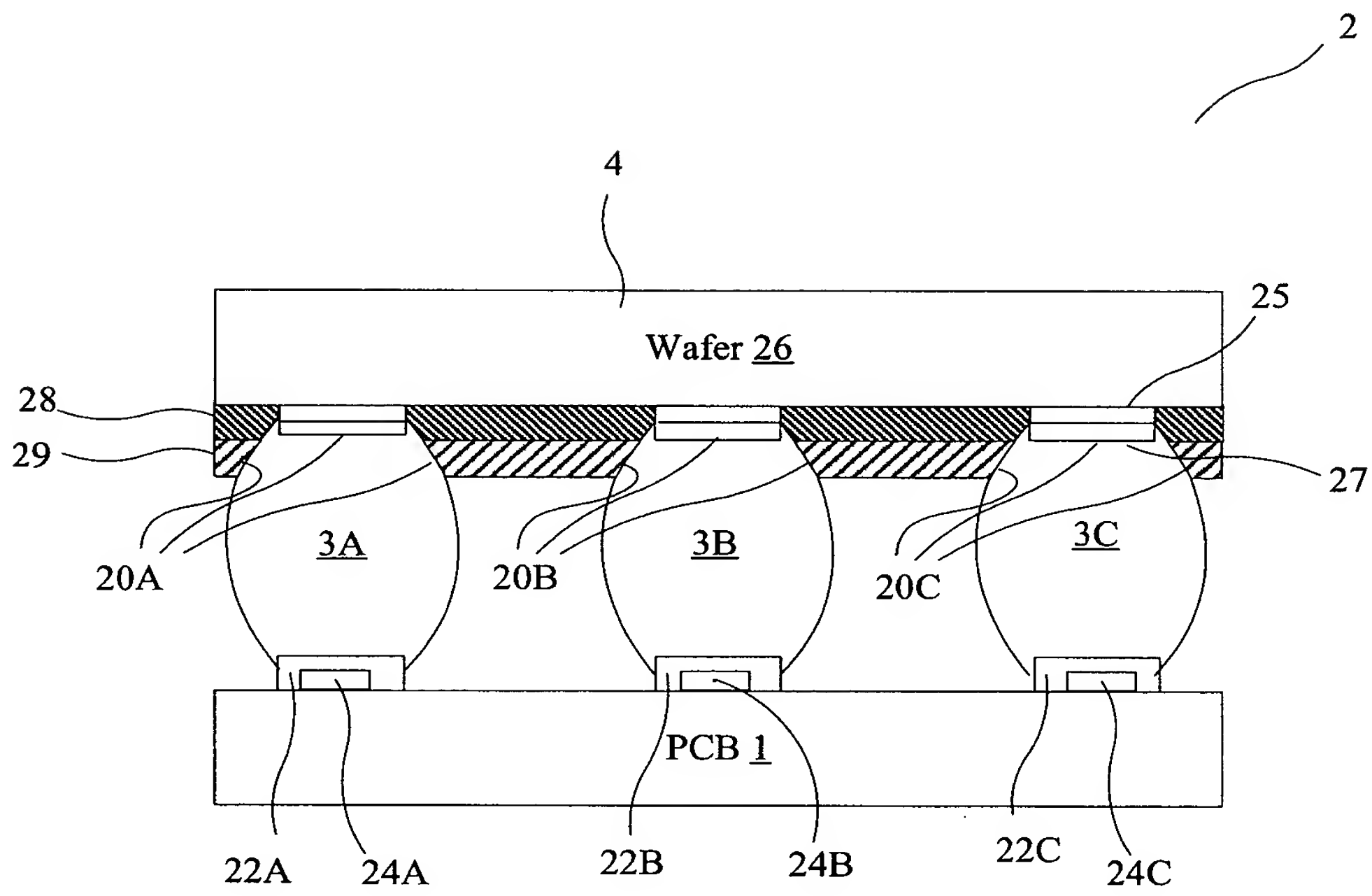


FIG. 2
(Prior Art)

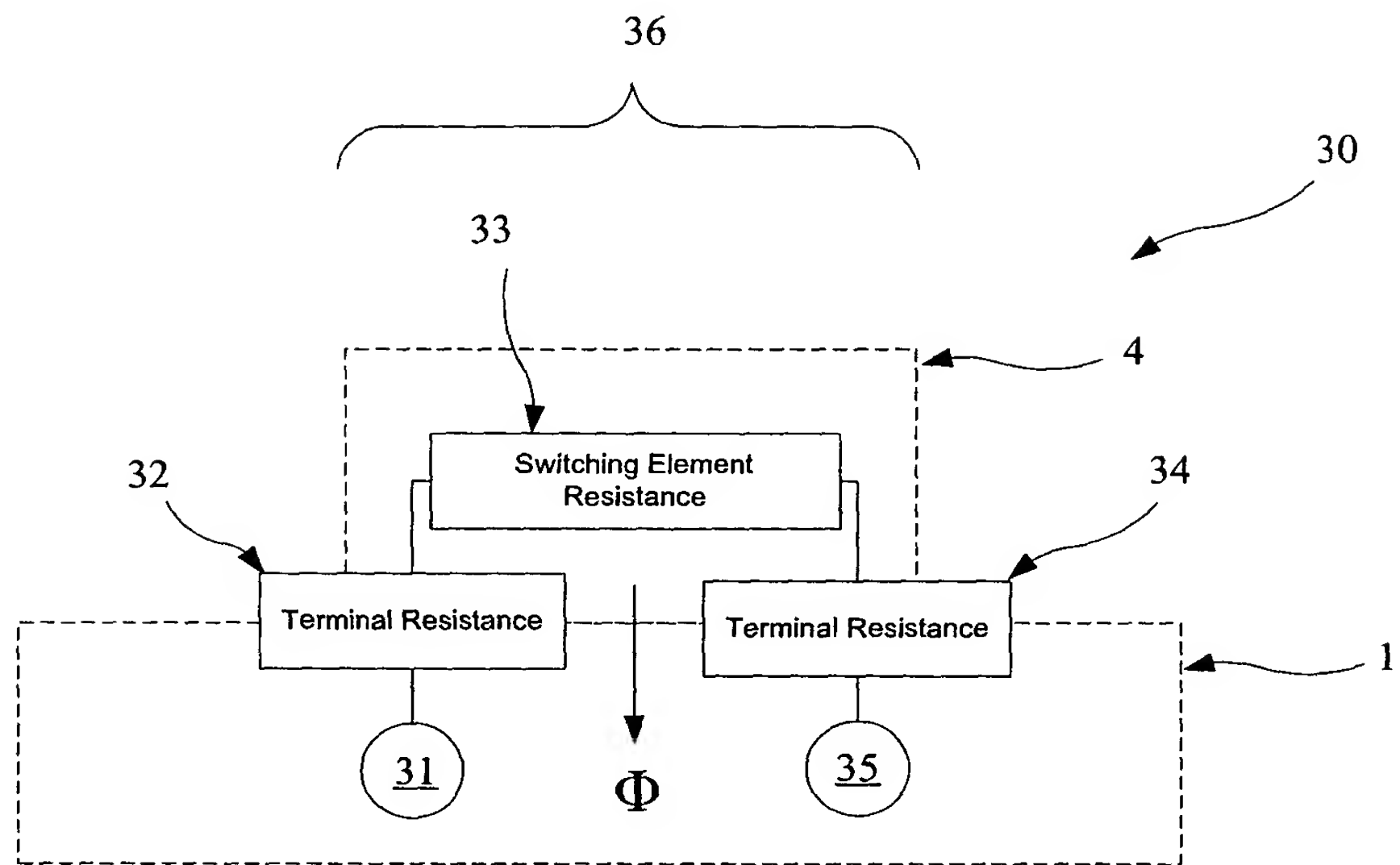


FIG. 3

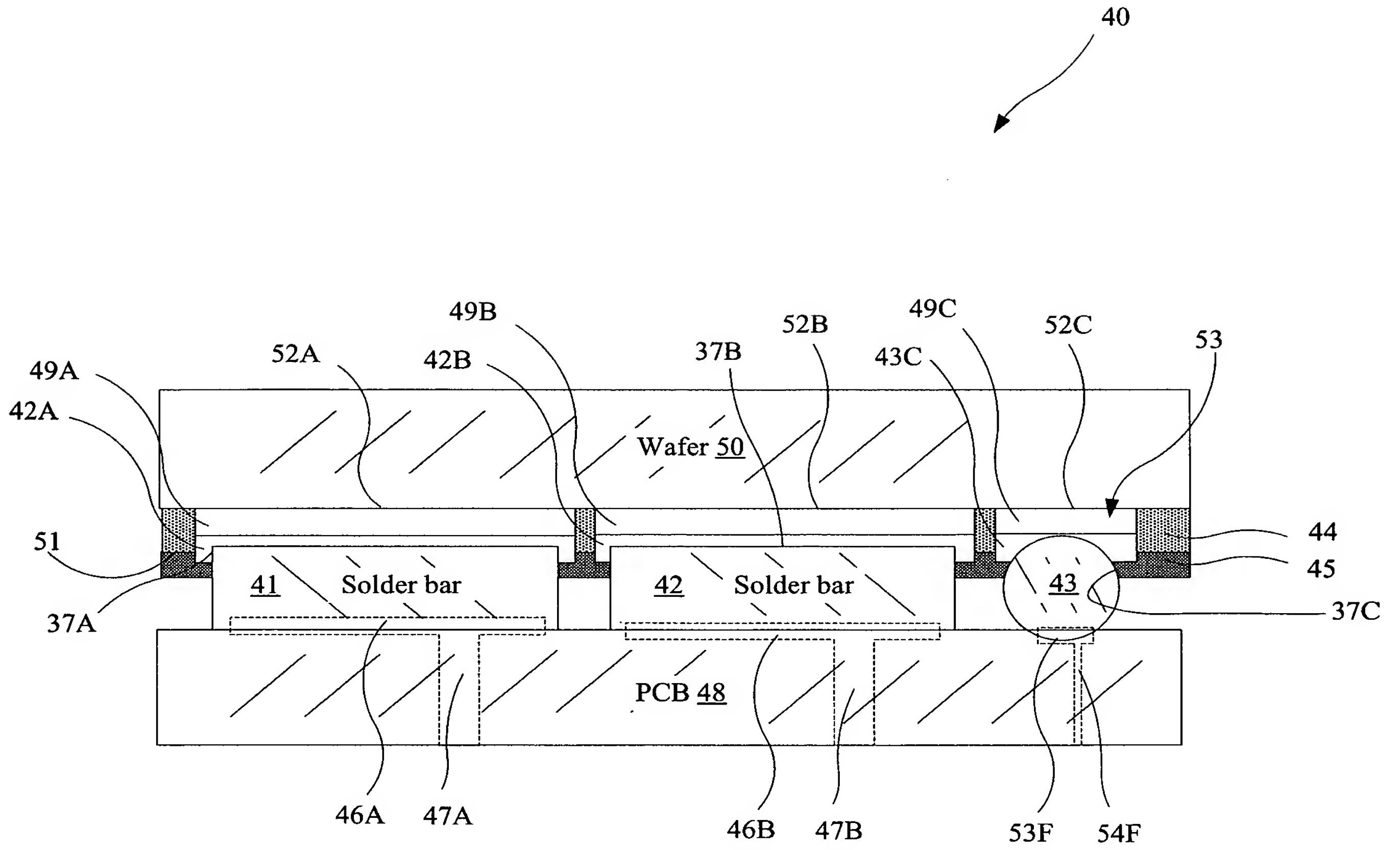


FIG. 4

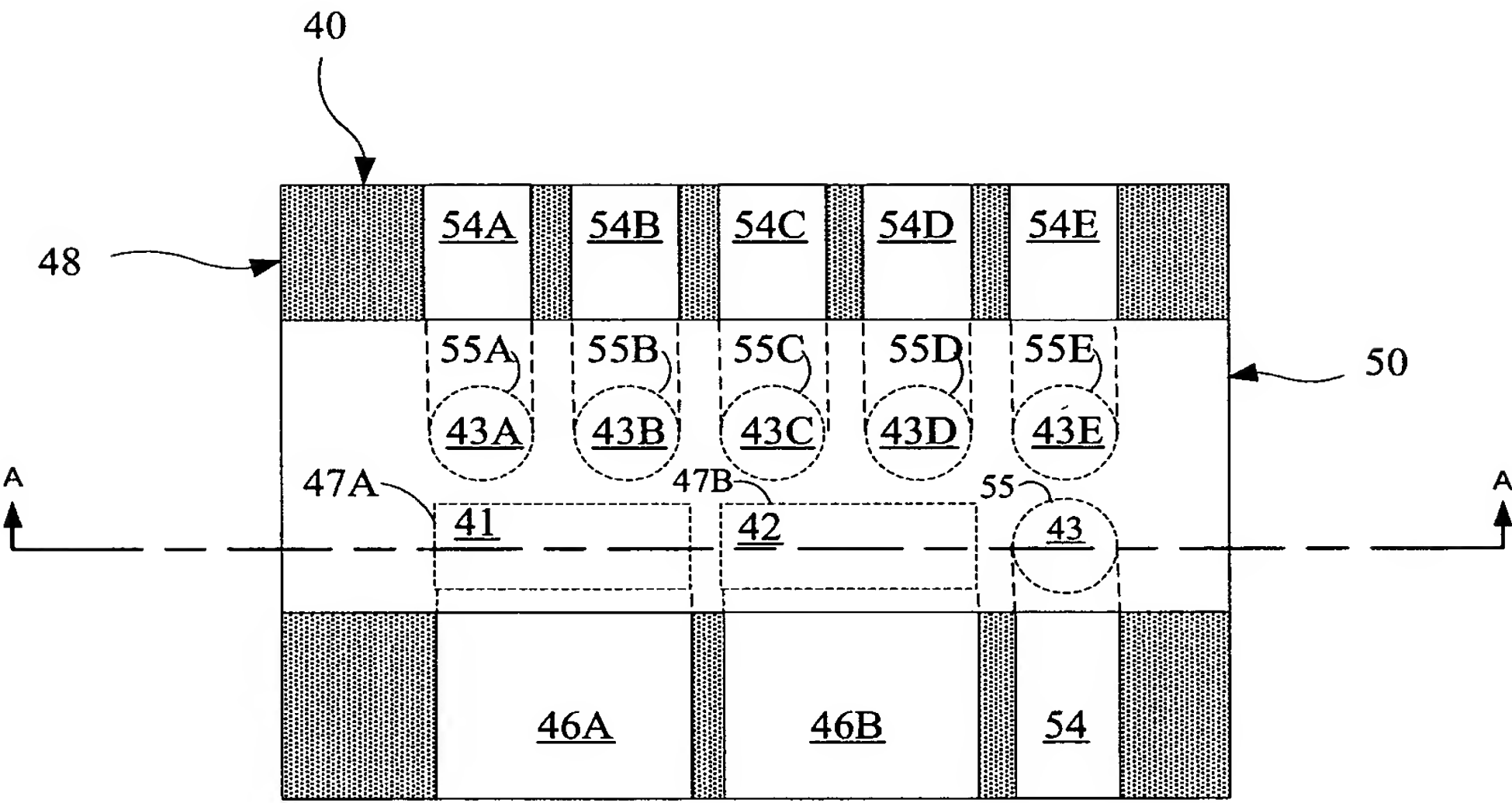


FIG. 5

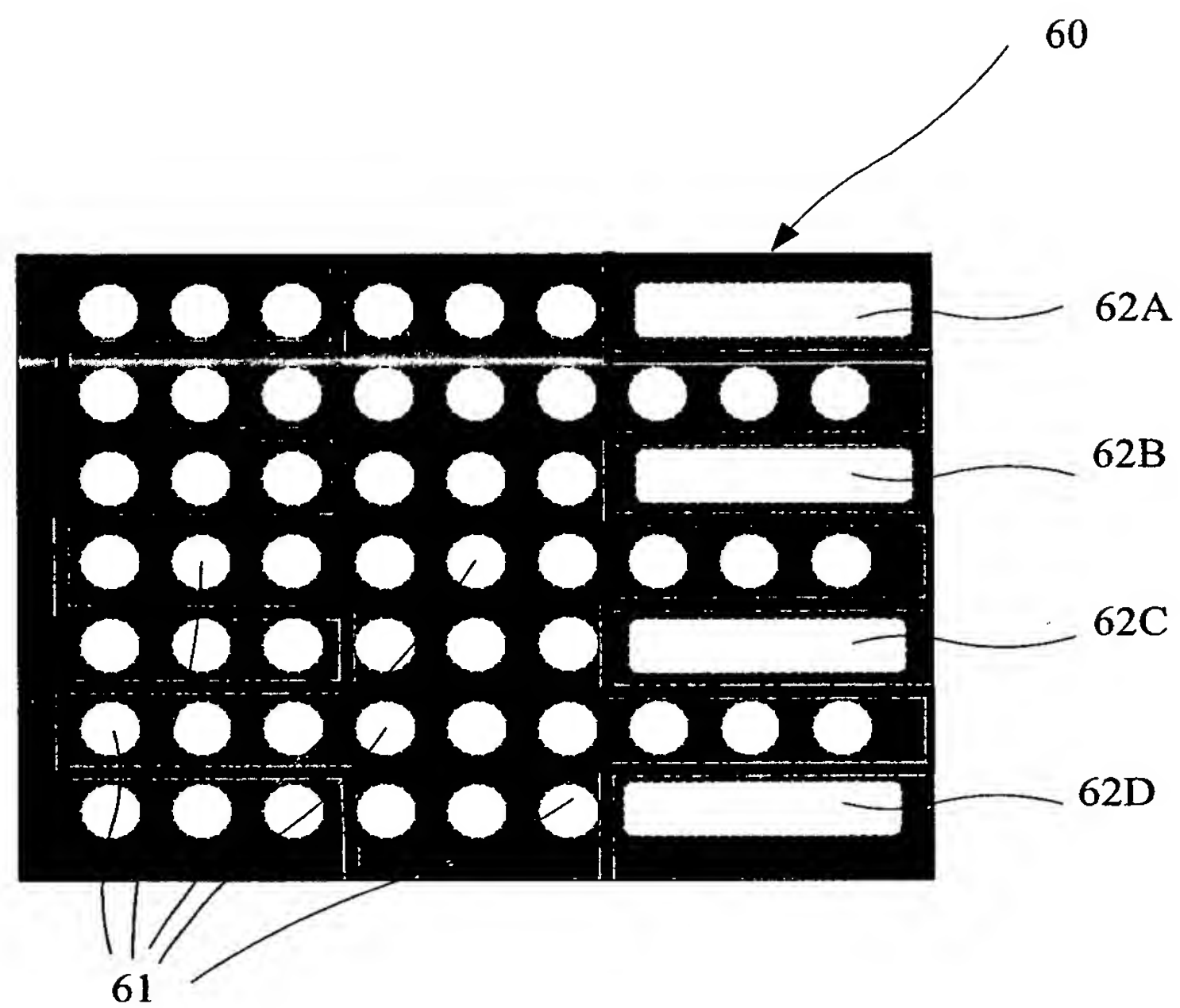
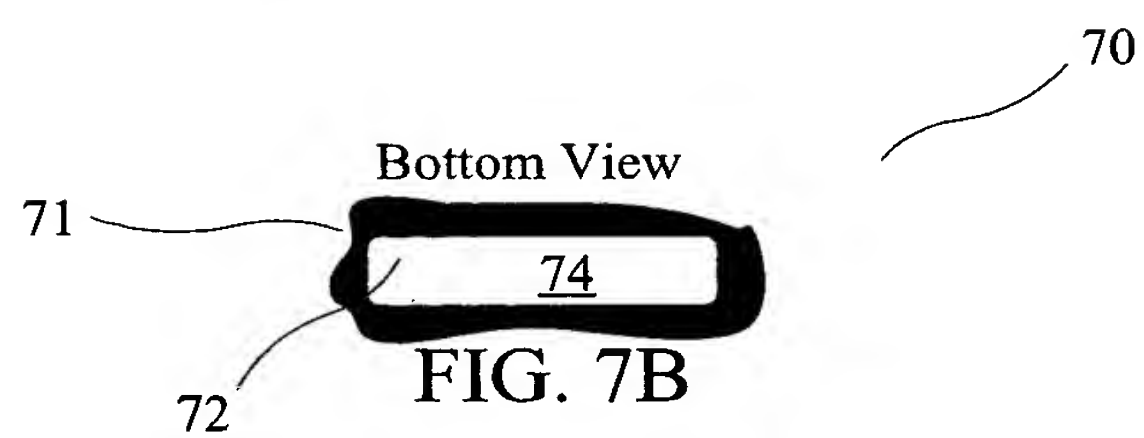
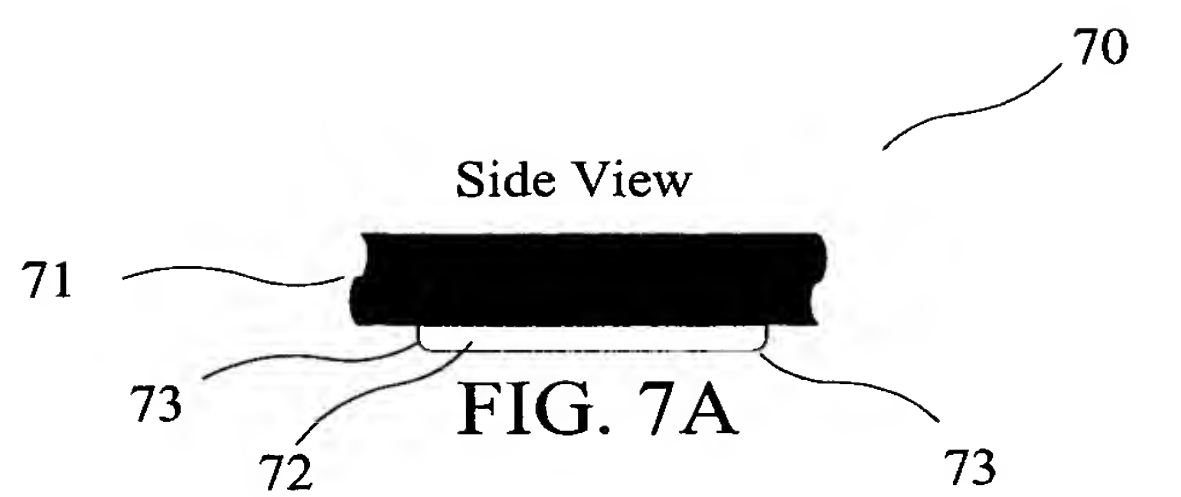


FIG. 6



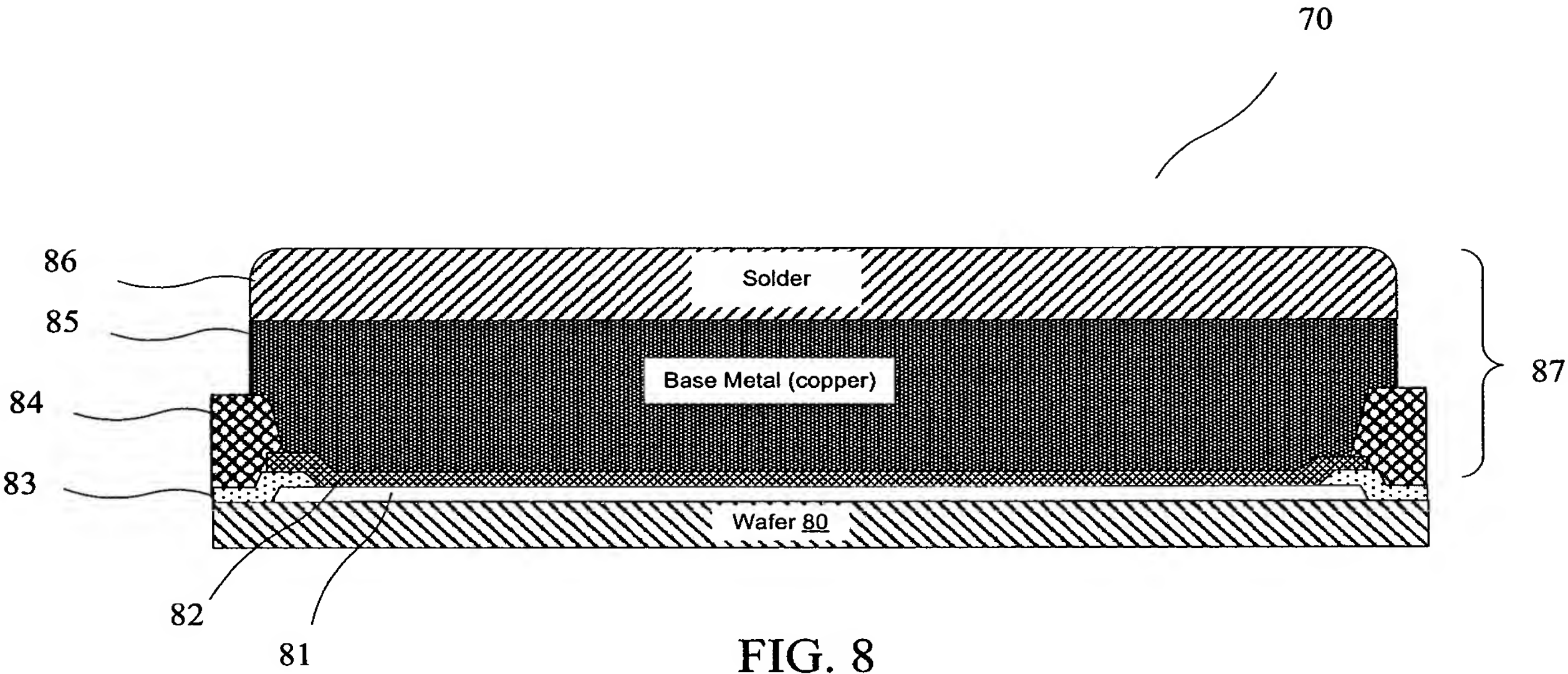


FIG. 8

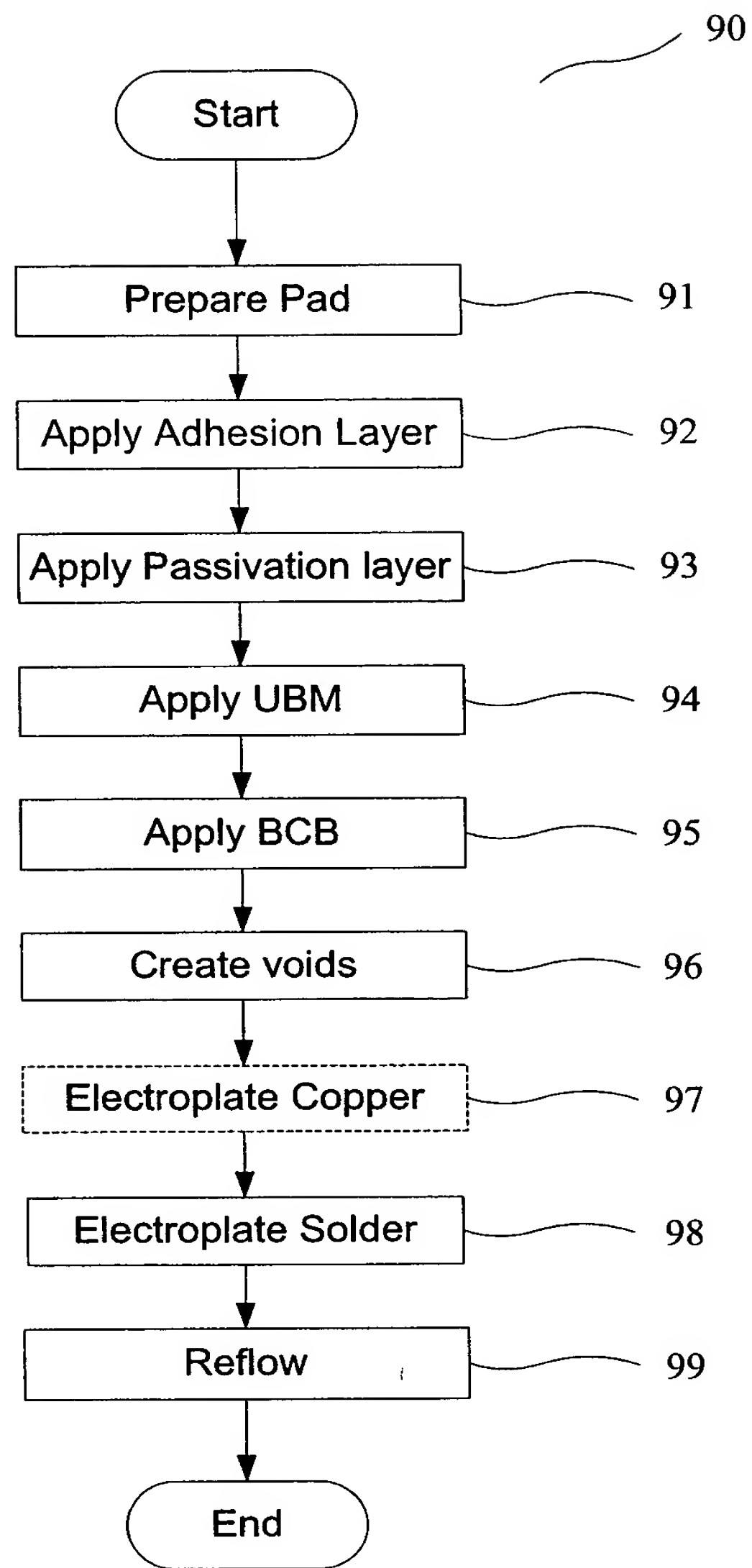
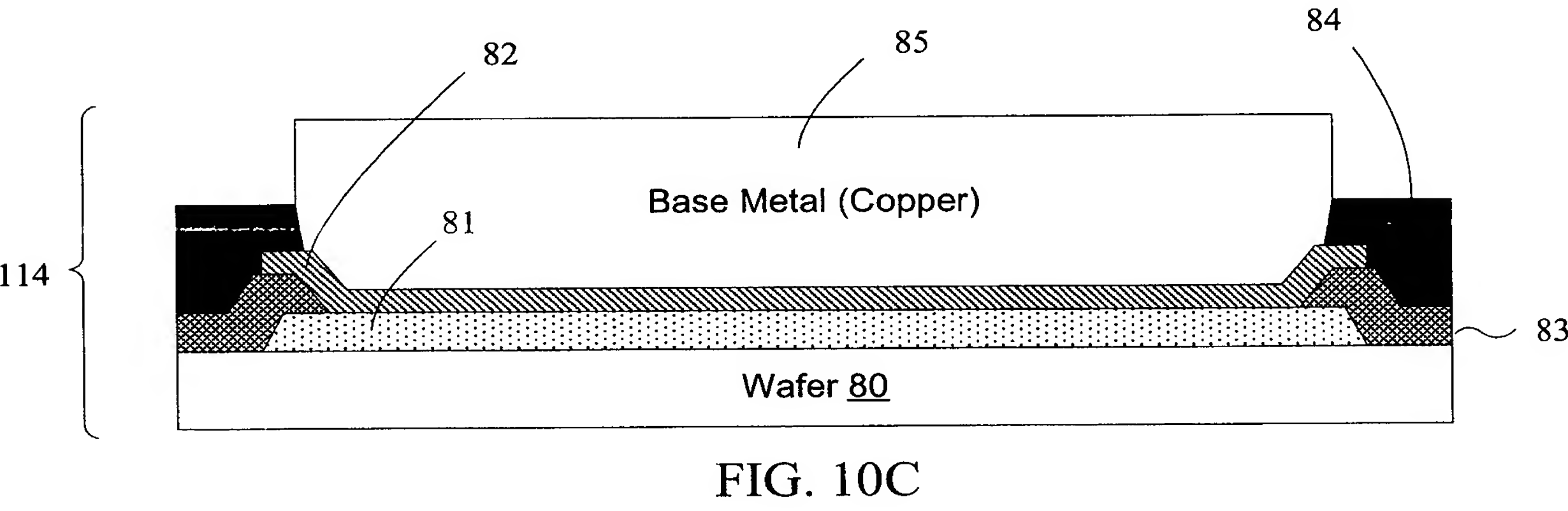
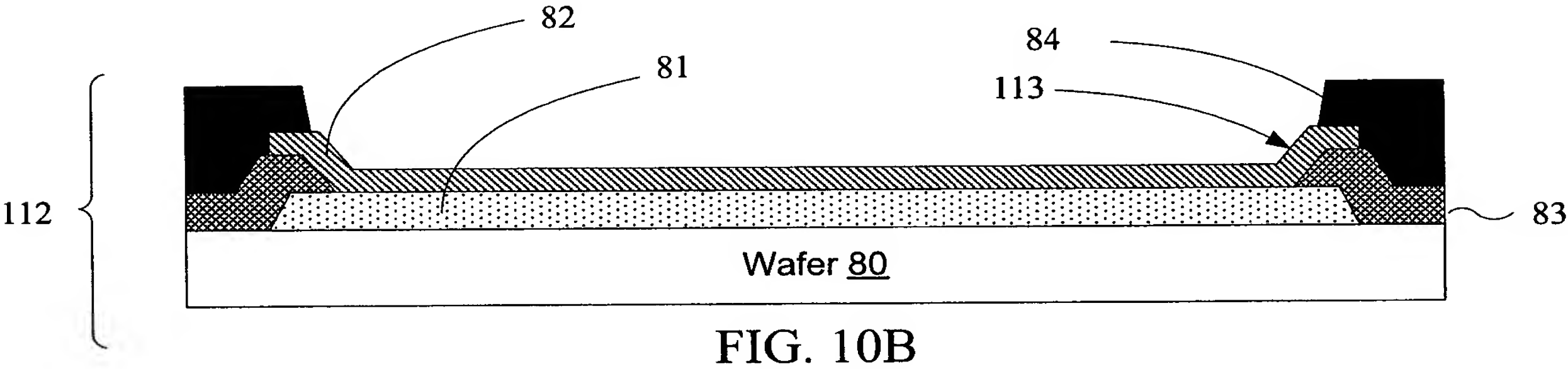
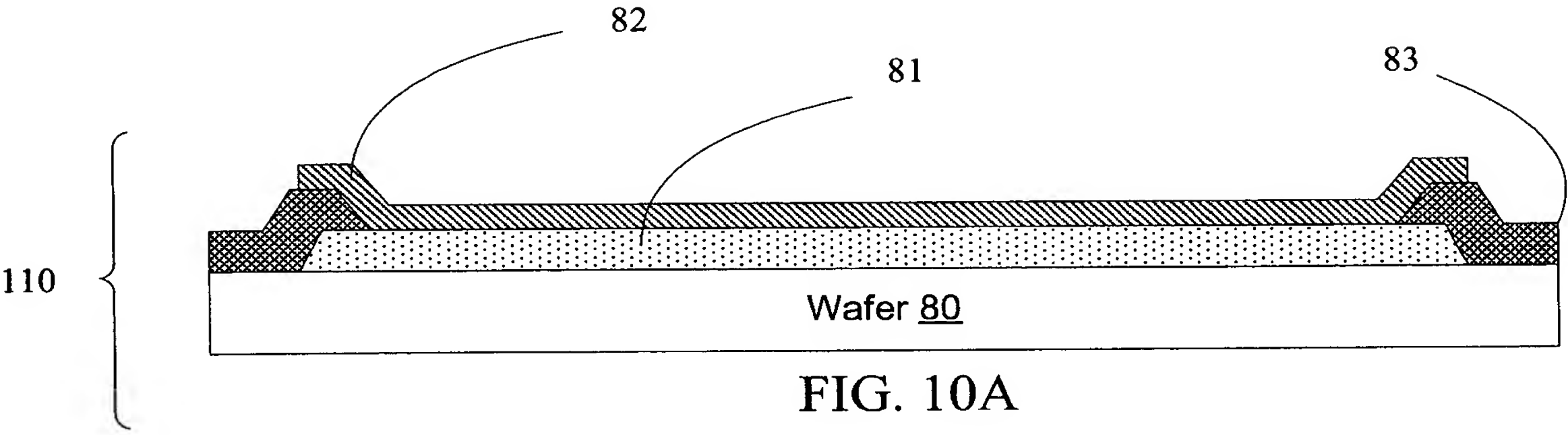


FIG. 9



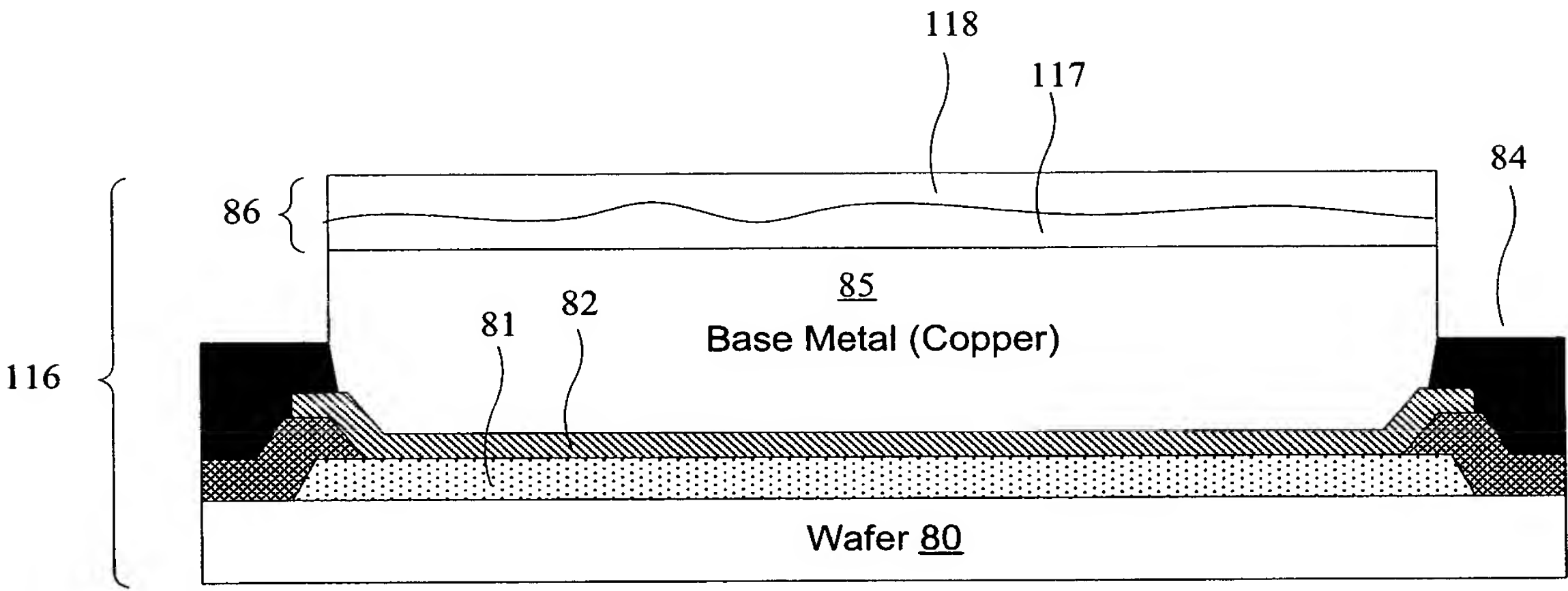


FIG. 10D

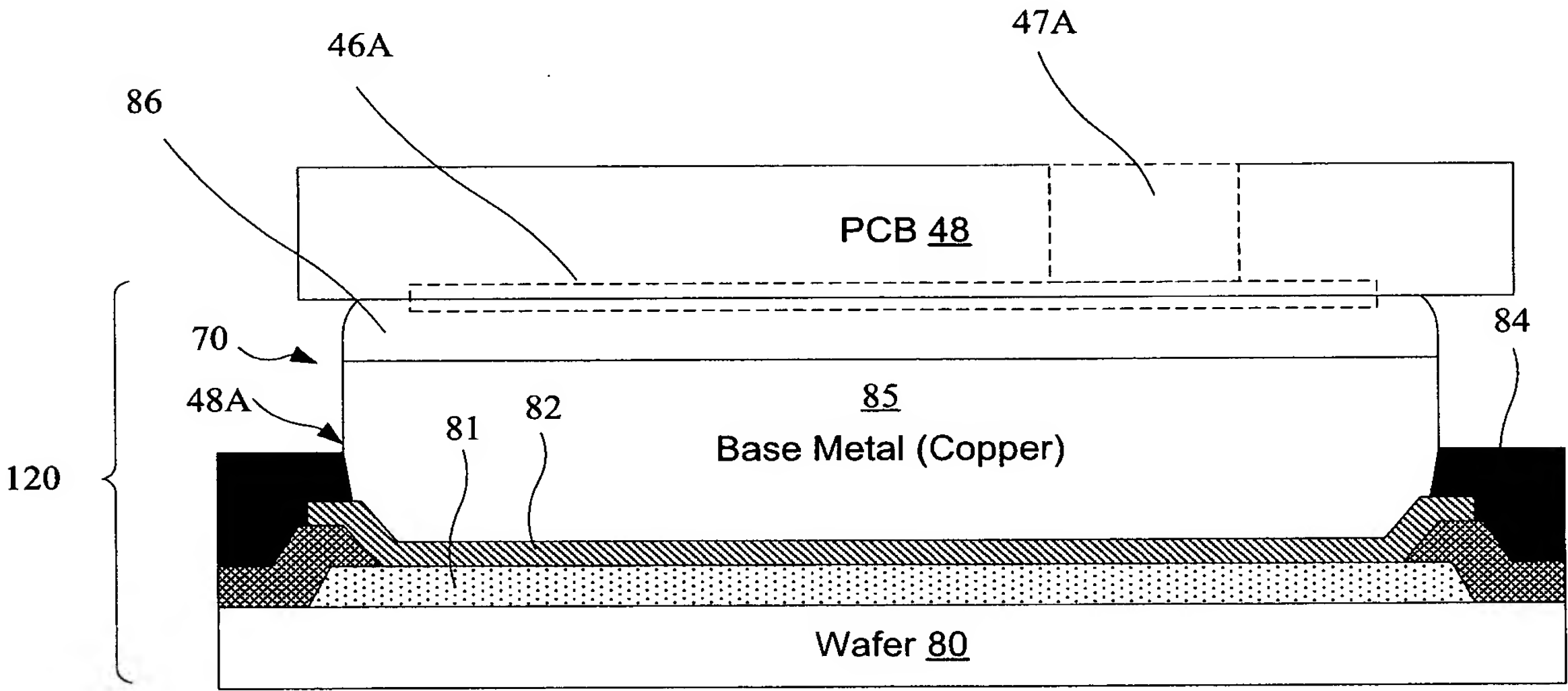


FIG. 10E

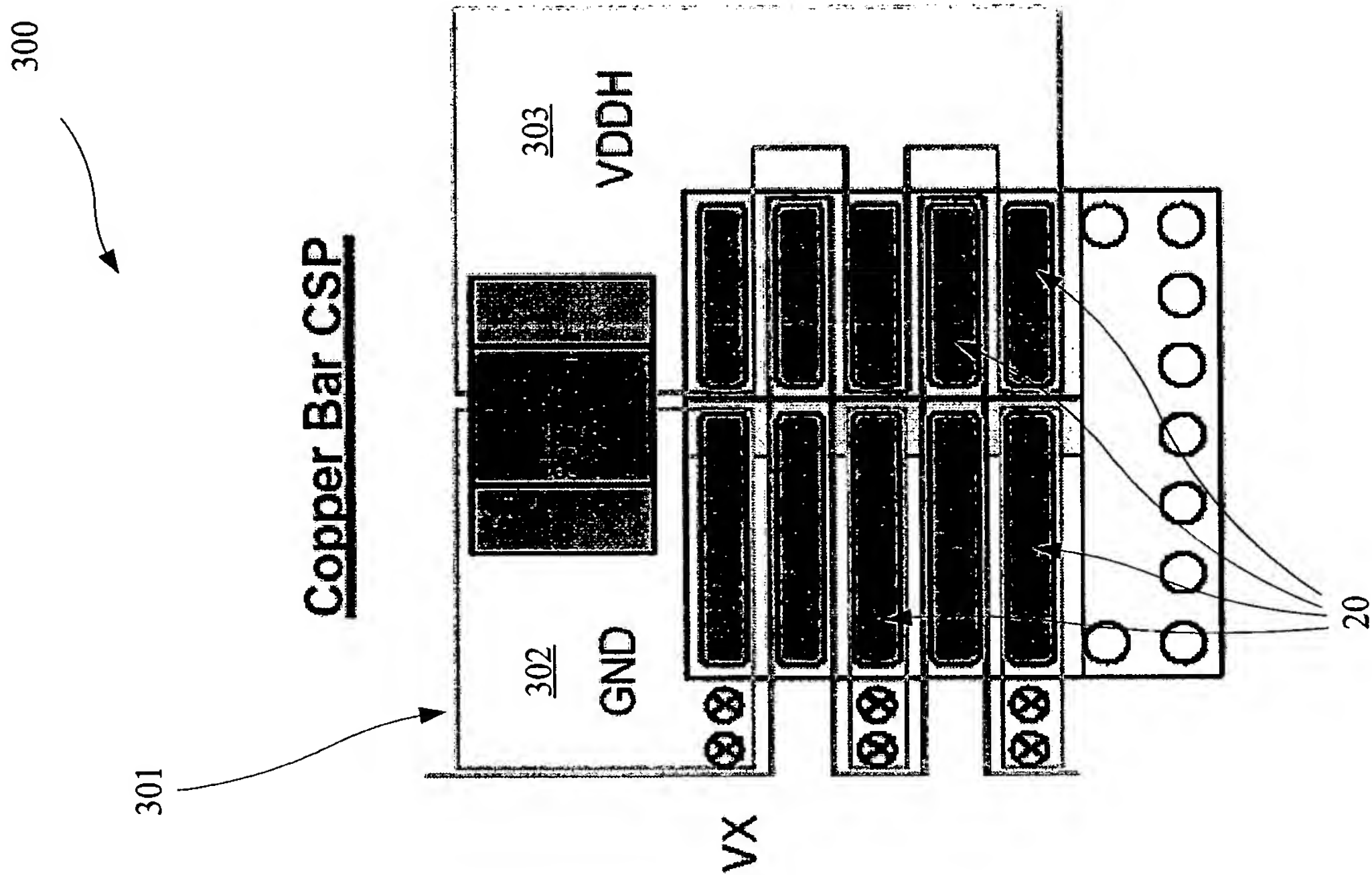
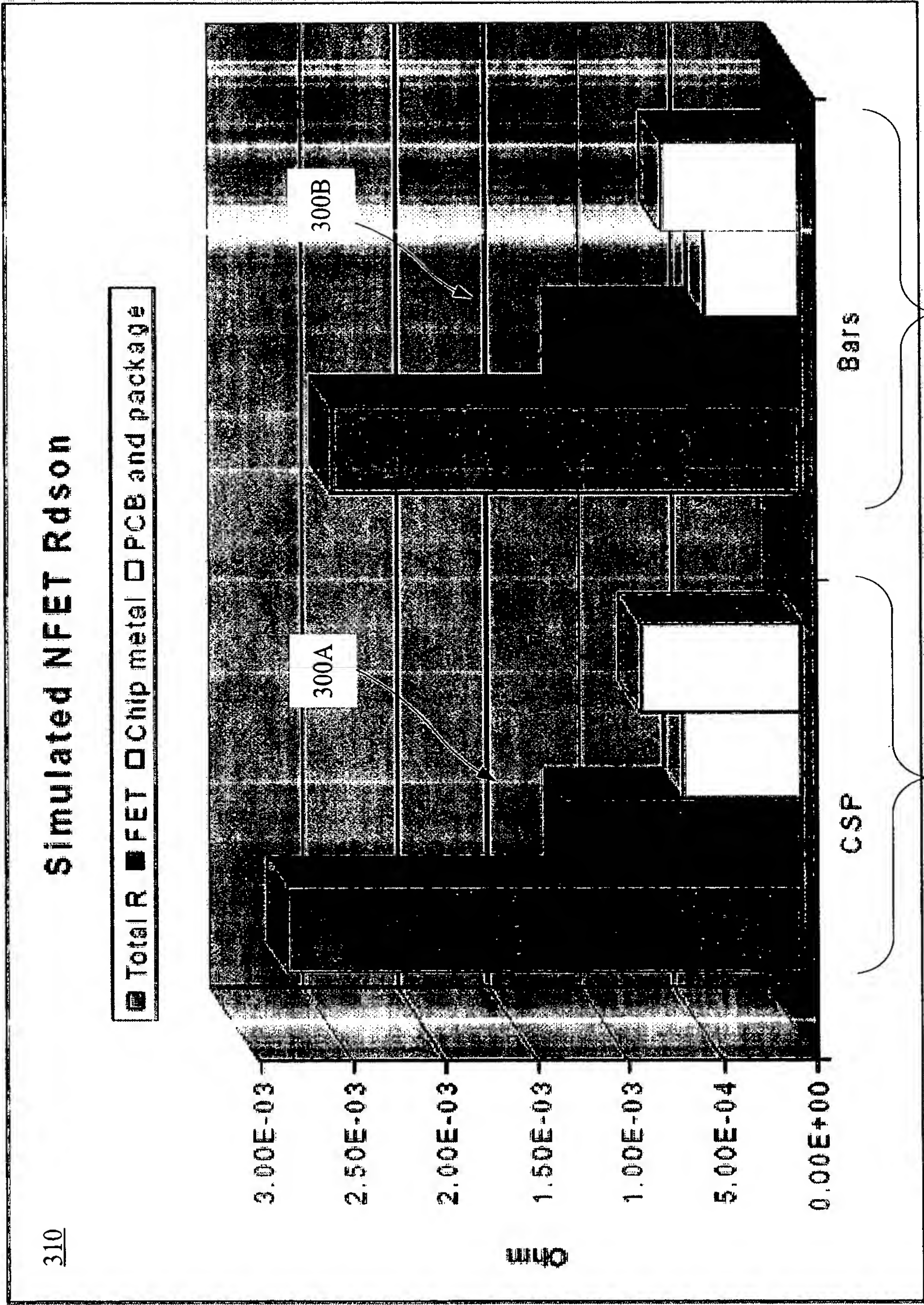


FIG. 11



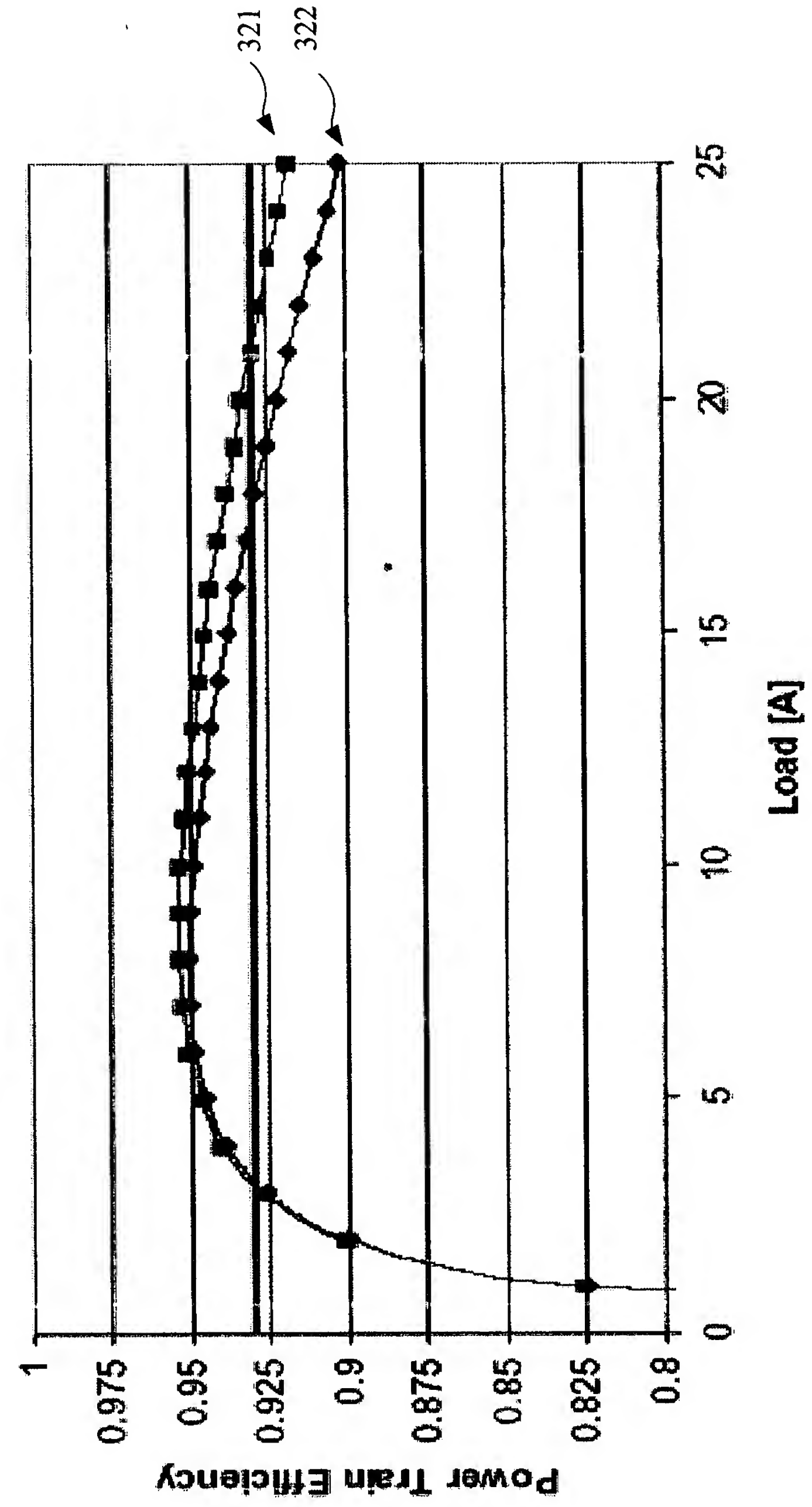
Solder bar gives 10-15% improvement in R_{ds} over CSP

FIG. 12

Copper Bars Enable Higher Efficiency or Higher Current

320

—◆— CSP —■— Bars — Efficiency Objective

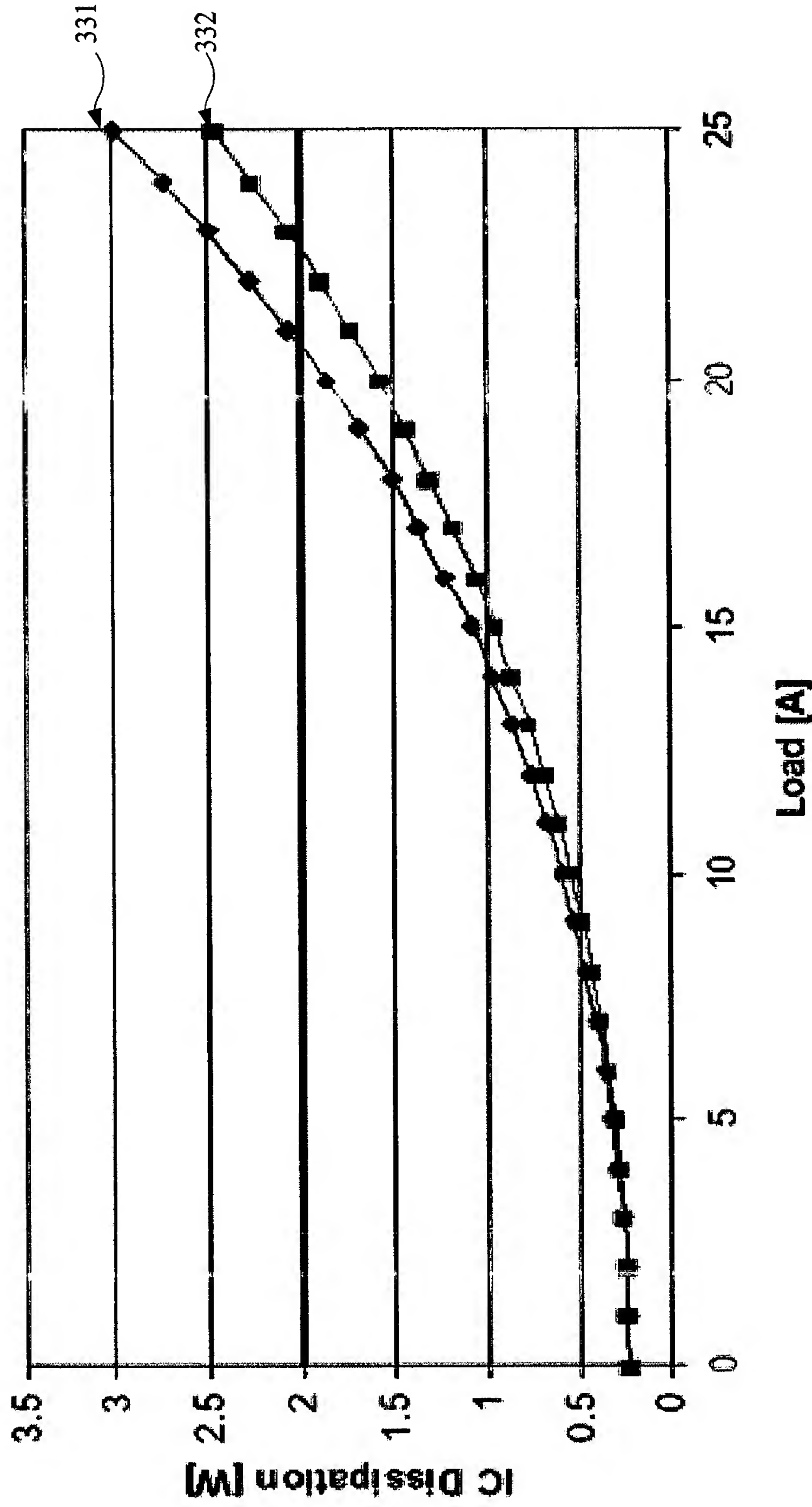
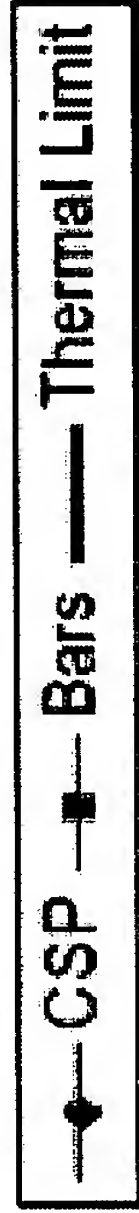


- 1.6% higher efficiency at 25A
- 3.5A more current (20%) at 93% efficiency

FIG. 13

Copper Bars Reduce Power Dissipation

330



- 550mW (18%) savings at 25A
- 2A more current (10%) at 2W dissipation

FIG. 14